



■ Features :

- Universal AC input / Full range
- Built-in active PFC function
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- OCP point adjustable through output cable or internal potential meter
- Suitable for LED lighting and moving sign applications
- IP67 / IP65 design for indoor or outdoor installations
- Compliance to worldwide safety regulations for lighting
- Suitable for dry / damp / wet locations
- 5 years warranty (Note.10)



SELV

**IP65**

**IP67**



HLG-240-12 **A** Blank : IP67 rated. Cable for I/O connection.

A : IP65 rated. Output voltage and constant current level can be adjusted through internal potential meter.

B : IP67 rated. Constant current level adjustable through output cable.

C : Terminal block for I/O connection. Output voltage and constant current level can be adjusted through internal potential meter.

## SPECIFICATION

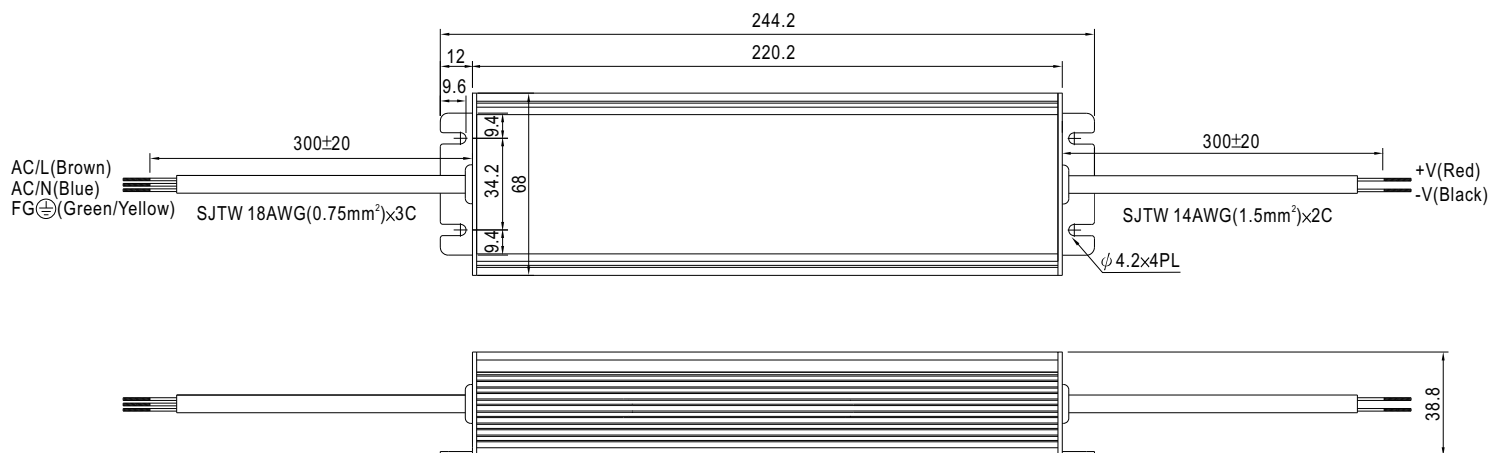
| MODEL                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | HLG-240-12□                                                                                                                                                                                         | HLG-240-15□ | HLG-240-20□  | HLG-240-24□  | HLG-240-30□ | HLG-240-36□  | HLG-240-42□  | HLG-240-48□  | HLG-240-54□  |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|--------------|-------------|--------------|--------------|--------------|--------------|
| OUTPUT                                 | DC VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 12V                                                                                                                                                                                                 | 15V         | 20V          | 24V          | 30V         | 36V          | 42V          | 48V          | 54V          |
|                                        | CONSTANT CURRENT REGION <small>Note.4</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 6 ~12V                                                                                                                                                                                              | 7.5 ~ 15V   | 10 ~ 20V     | 12 ~ 24V     | 15 ~ 30V    | 18 ~ 36V     | 21 ~ 42V     | 24 ~ 48V     | 27 ~ 54V     |
|                                        | RATED CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 16A                                                                                                                                                                                                 | 15A         | 12A          | 10A          | 8A          | 6.7A         | 5.72A        | 5A           | 4.45A        |
|                                        | RATED POWER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 192W                                                                                                                                                                                                | 225W        | 240W         | 240W         | 240W        | 241.2W       | 240.2W       | 240W         | 240.3W       |
|                                        | RIPPLE & NOISE (max.) <small>Note.2</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 150mVp-p                                                                                                                                                                                            | 150mVp-p    | 150mVp-p     | 150mVp-p     | 200mVp-p    | 250mVp-p     | 250mVp-p     | 250mVp-p     | 350mVp-p     |
|                                        | VOLTAGE ADJ. RANGE <small>Note.6</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 11.2 ~ 12.8V                                                                                                                                                                                        | 14 ~ 16V    | 18.6 ~ 21.4V | 22.4 ~ 25.6V | 28 ~ 32V    | 33.5 ~ 38.5V | 39 ~ 45V     | 44.8 ~ 51.2V | 50 ~ 57V     |
|                                        | CURRENT ADJ. RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Can be adjusted by internal potential meter or through output cable                                                                                                                                 |             |              |              |             |              |              |              |              |
|                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 8 ~ 16A                                                                                                                                                                                             | 7.5 ~ 15A   | 6 ~ 12A      | 5 ~ 10A      | 4 ~ 8A      | 3.3 ~ 6.7A   | 2.86 ~ 5.72A | 2.5 ~ 5A     | 2.23 ~ 4.45A |
|                                        | VOLTAGE TOLERANCE <small>Note.3</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | ±2.5%                                                                                                                                                                                               | ±2.0%       | ±1.0%        | ±1.0%        | ±1.0%       | ±1.0%        | ±1.0%        | ±1.0%        | ±1.0%        |
|                                        | LINE REGULATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ±0.5%                                                                                                                                                                                               | ±0.5%       | ±0.5%        | ±0.5%        | ±0.5%       | ±0.5%        | ±0.5%        | ±0.5%        | ±0.5%        |
| LOAD REGULATION                        | ±2.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ±1.5%                                                                                                                                                                                               | ±1.0%       | ±0.5%        | ±0.5%        | ±0.5%       | ±0.5%        | ±0.5%        | ±0.5%        |              |
| SETUP, RISE TIME <small>Note.8</small> | 2500ms, 80ms at full load    230VAC /115VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                     |             |              |              |             |              |              |              |              |
| HOLD UP TIME (Typ.)                    | 15ms at full load    230VAC /115VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |             |              |              |             |              |              |              |              |
| INPUT                                  | VOLTAGE RANGE <small>Note.5</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 90 ~ 264VAC    127 ~ 373VDC                                                                                                                                                                         |             |              |              |             |              |              |              |              |
|                                        | FREQUENCY RANGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 47 ~ 63Hz                                                                                                                                                                                           |             |              |              |             |              |              |              |              |
|                                        | POWER FACTOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PF ≥ 0.95/230VAC    PF ≥ 0.98/115VAC at full load and rated output voltage    PF ≥ 0.9 at 65 ~ 100% load                                                                                            |             |              |              |             |              |              |              |              |
|                                        | EFFICIENCY (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 90%                                                                                                                                                                                                 | 90%         | 92%          | 93%          | 93%         | 93.5%        | 94%          | 94%          | 94%          |
|                                        | AC CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 4A / 115VAC    2A / 230VAC                                                                                                                                                                          |             |              |              |             |              |              |              |              |
|                                        | INRUSH CURRENT (Typ.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | COLD START 75A/230VAC                                                                                                                                                                               |             |              |              |             |              |              |              |              |
| LEAKAGE CURRENT                        | <0.75mA / 240VAC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                     |             |              |              |             |              |              |              |              |
| PROTECTION                             | OVER CURRENT <small>Note.4</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 95 ~ 108%<br>Protection type : Constant current limiting, recovers automatically after fault condition is removed                                                                                   |             |              |              |             |              |              |              |              |
|                                        | SHORT CIRCUIT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Hiccup mode, recovers automatically after fault condition is removed.                                                                                                                               |             |              |              |             |              |              |              |              |
|                                        | OVER VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13.5 ~ 16V    16.5 ~ 19.5V    22 ~ 26V    26 ~ 33V    32.5 ~ 36.5V    40 ~ 48V    46 ~ 50V    59 ~ 65V    59 ~ 65V<br>Protection type : Shut down and latch off o/p voltage, re-power on to recover |             |              |              |             |              |              |              |              |
|                                        | OVER TEMPERATURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 105℃ ±5℃ (TSW1)    95℃ ±5℃ (TSW1)<br>Protection type : Shut down o/p voltage, recovers automatically after temperature goes down                                                                    |             |              |              |             |              |              |              |              |
| ENVIRONMENT                            | WORKING TEMP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | -30 ~ +60℃ @ full load ; +70℃ @ 60% load (Refer to derating curve)                                                                                                                                  |             |              |              |             |              |              |              |              |
|                                        | WORKING HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 20 ~ 95% RH non-condensing                                                                                                                                                                          |             |              |              |             |              |              |              |              |
|                                        | STORAGE TEMP., HUMIDITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | -40 ~ +80℃, 10 ~ 95% RH                                                                                                                                                                             |             |              |              |             |              |              |              |              |
|                                        | TEMP. COEFFICIENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ±0.03%/℃ (0 ~ 50℃)                                                                                                                                                                                  |             |              |              |             |              |              |              |              |
| SAFETY & EMC                           | VIBRATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 10 ~ 500Hz, 5G 12min./1cycle, period for 72min. each along X, Y, Z axes                                                                                                                             |             |              |              |             |              |              |              |              |
|                                        | SAFETY STANDARDS <small>Note.7</small>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | UL1012, TUV EN61347-1, EN61347-2-13 independent (except for HLG-240H C type), UL60950-1, UL8750, TUV EN60950-1, IP65 or IP67 approved                                                               |             |              |              |             |              |              |              |              |
|                                        | WITHSTAND VOLTAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | I/P-O/P:3.75KVAC    I/P-FG:1.88KVAC    O/P-FG:0.5KVAC                                                                                                                                               |             |              |              |             |              |              |              |              |
|                                        | ISOLATION RESISTANCE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃ / 70% RH                                                                                                                                           |             |              |              |             |              |              |              |              |
|                                        | EMI CONDUCTION & RADIATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Compliance to EN55015, EN55022 (CISPR22) Class B                                                                                                                                                    |             |              |              |             |              |              |              |              |
|                                        | HARMONIC CURRENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Compliance to EN61000-3-2 Class C (≥ 50% load) ; EN61000-3-3                                                                                                                                        |             |              |              |             |              |              |              |              |
| OTHERS                                 | EMS IMMUNITY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN61547, EN55024, heavy industry level (surge 4KV), criteria A                                                                                    |             |              |              |             |              |              |              |              |
|                                        | MTBF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 207.9Khrs min.    MIL-HDBK-217F (25℃)                                                                                                                                                               |             |              |              |             |              |              |              |              |
|                                        | DIMENSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 244.2*68*38.8mm (L*W*H)(HLG-240-Blank/A/B)    251*68*38.8mm (L*W*H)(HLG-240-C)                                                                                                                      |             |              |              |             |              |              |              |              |
|                                        | PACKING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1.3Kg; 12pcs/16.6Kg/0.74CUFT(HLG-240-Blank/A/B)    1.23Kg; 12pcs/15.8Kg/1.16CUFT(HLG-240-C)                                                                                                         |             |              |              |             |              |              |              |              |
| NOTE                                   | 1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature.<br>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.<br>3. Tolerance : includes set up tolerance, line regulation and load regulation.<br>4. Constant current operation region is within 50% ~100% rated output voltage. This is the suitable operation region for LED related applications, but please reconfirm special electrical requirements for some specific system design.<br>5. Derating may be needed under low input voltages. Please check the static characteristics for more details.<br>6. Type A and type C only.<br>7. Safety and EMC design refer to EN60598-1, subject 8750(UL), CNS15233, GB7000.1, FCC part18.<br>8. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time.<br>9. The power supply is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.<br>10. Refer to warranty statement. |                                                                                                                                                                                                     |             |              |              |             |              |              |              |              |

## Mechanical Specification

Case No.954C

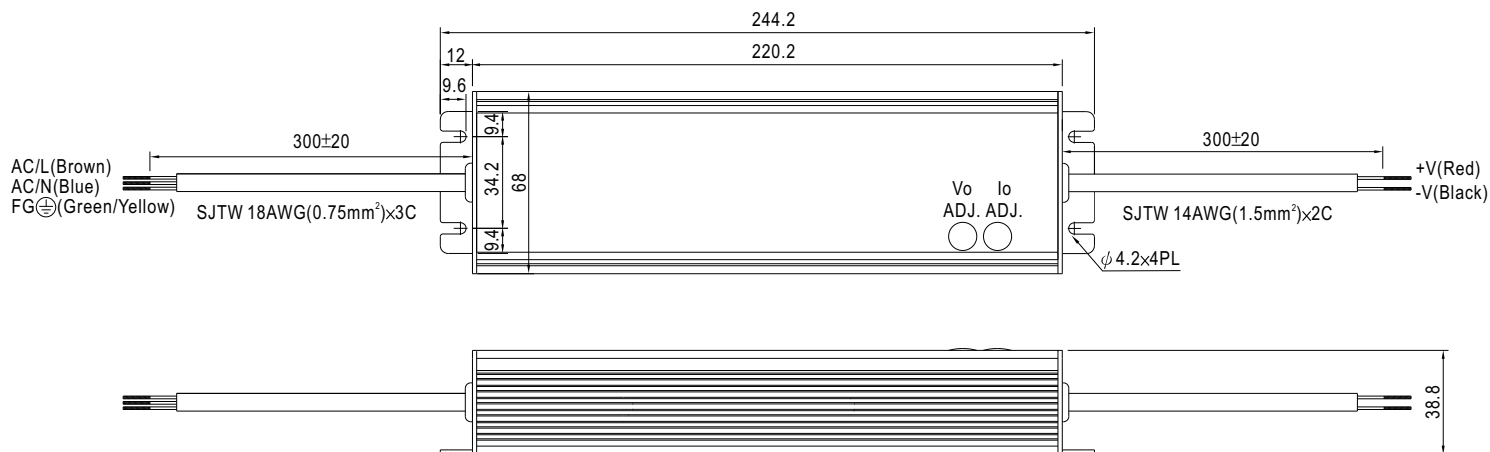
Unit:mm

### Blank:(HLG-240)



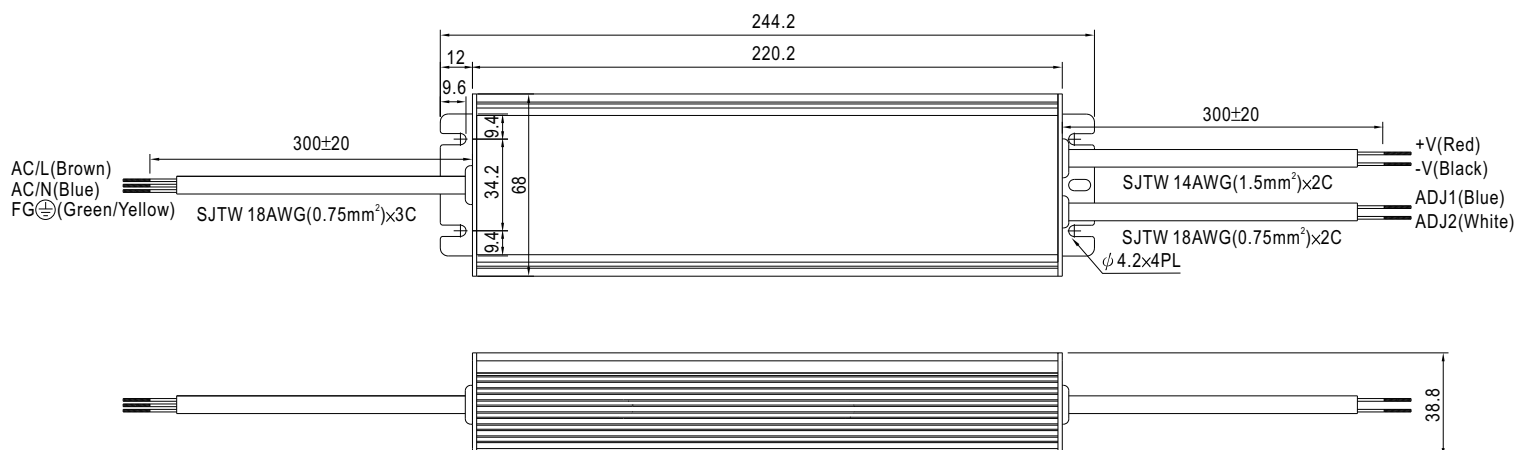
※IP67 rated. Cable for I/O connection.

### A Type:(HLG-240- \_A)



※ IP65 rated. Output voltage and constant current level can be adjusted through internal potential meter.  
(Can access by removing the rubber stopper on the case.)

## B Type:(HLG-240-\_B)

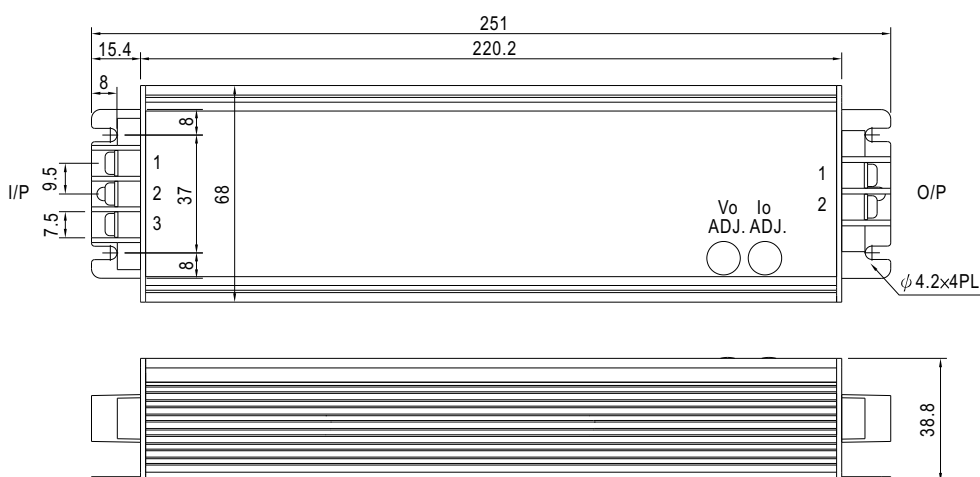


※ IP67 rated. Output constant current level can be adjusted through output cable by connecting a resistor between ADJ1 and ADJ2.

※ Reference resistance value for output current adjustment (Typical)

| Percentage of rated current \ Model | 12V   | 15V   | 20V   | 24V   | 30V   | 36V   | 42V   | 48V   | 54V   |
|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Slightly > 100%                     | Open  | Open  | Open  | Open  | Open  | Open  | Open  | Open  | Open  |
| 75%                                 | 680Ω  | 560Ω  | 680Ω  | 510Ω  | 820Ω  | 1.8KΩ | 680Ω  | 620Ω  | 820Ω  |
| 50%                                 | 120Ω  | 47Ω   | 91Ω   | 51Ω   | 120Ω  | 500Ω  | 82Ω   | 68Ω   | 150Ω  |
| Slightly < 50%                      | Short | Short | Short | Short | Short | Short | Short | Short | Short |

## C Type:(HLG-240-\_C)



AC Input Terminal Pin No. Assignment

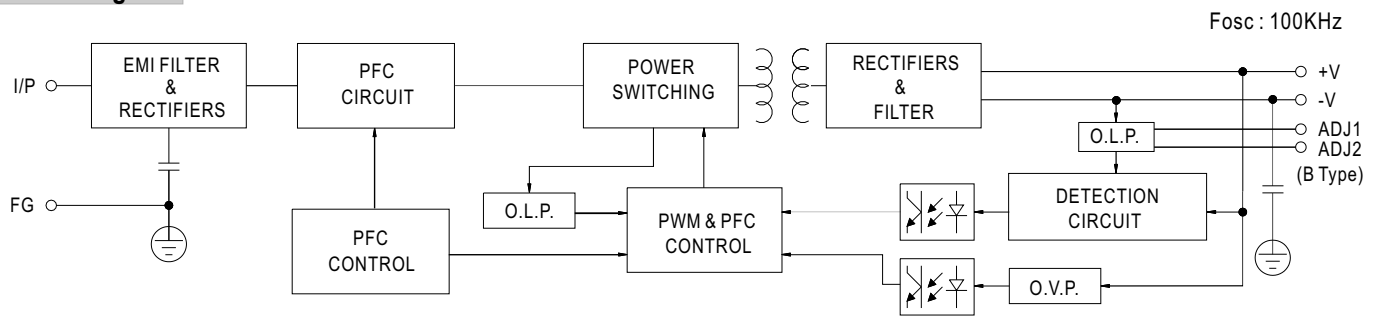
| Pin No. | Assignment |
|---------|------------|
| 1       | FG $\perp$ |
| 2       | AC/L       |
| 3       | AC/N       |

DC Output Terminal Pin No. Assignment

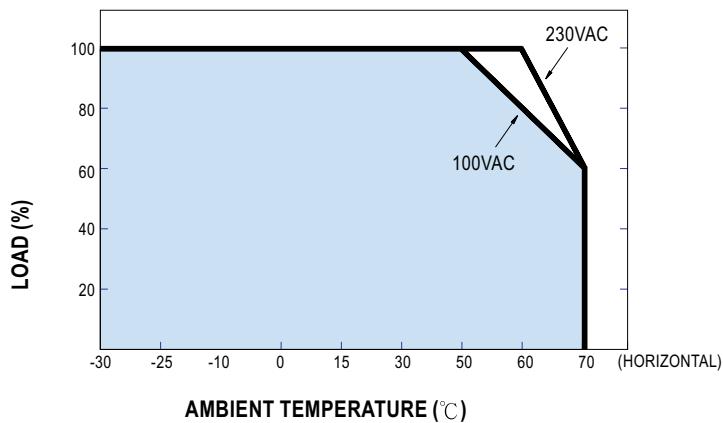
| Pin No. | Assignment |
|---------|------------|
| 1       | -V         |
| 2       | +V         |

※ Output voltage and constant current level can be adjusted through internal potential meter.  
 (Can access by removing the rubber stopper on the case.)

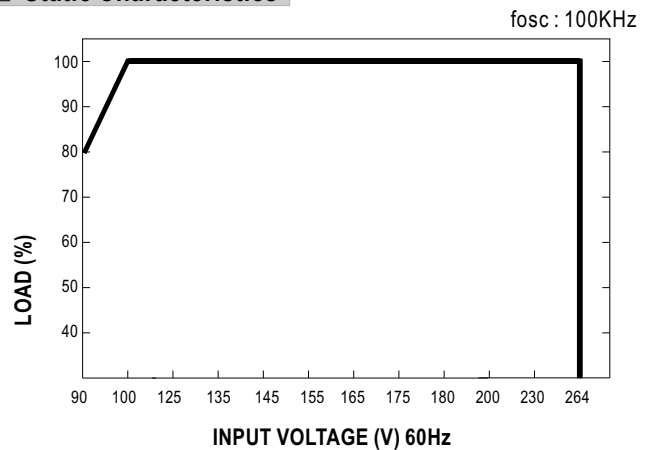
## Block Diagram



## Derating Curve



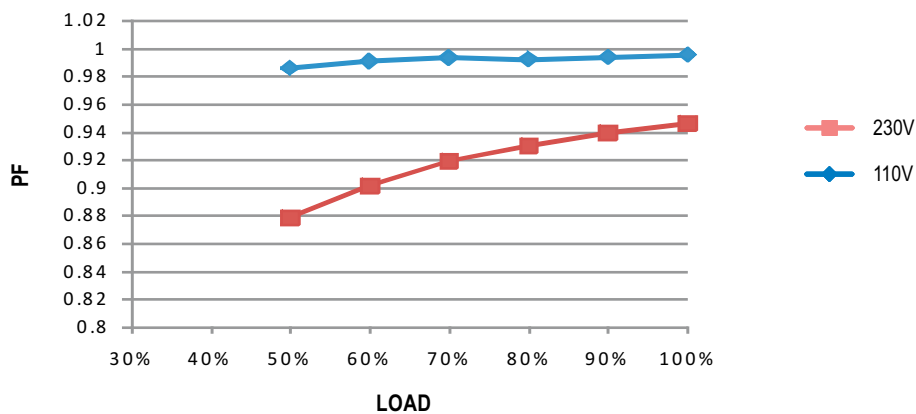
## Static Characteristics



## Power Factor Characteristic

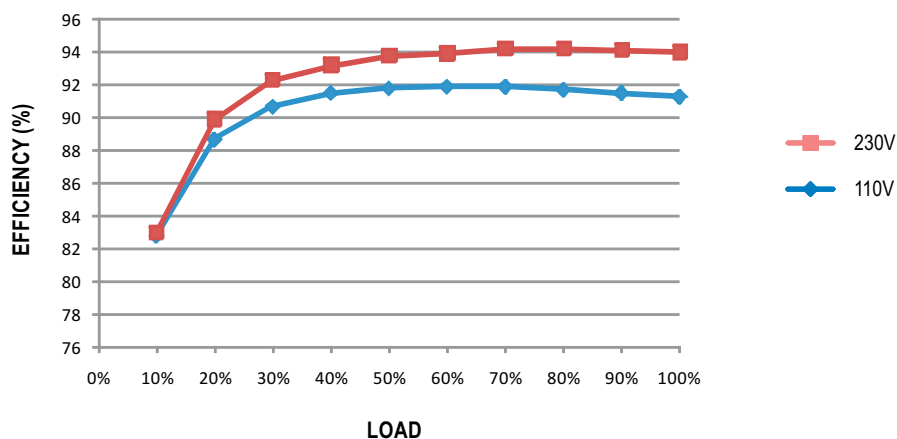
Power factor will be higher than 0.9 when output loading is 65% or higher.

### Constant Current Mode



## EFFICIENCY vs LOAD (48V Model)

HLG-240 series possess superior working efficiency that up to 94% can be reached in field applications.

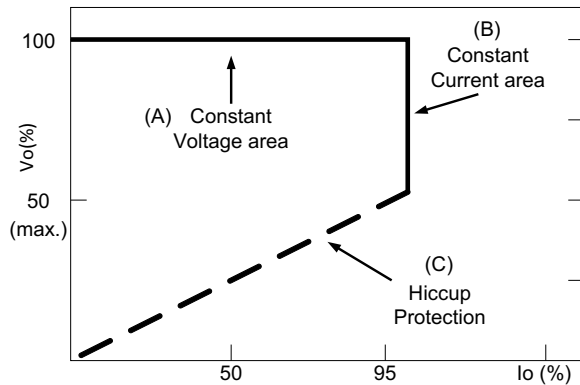


## DRIVING METHODS OF LED MODULE

There are two major kinds of LED drive method "direct drive" and "with LED driver".

A typical LED power supply may either work in "constant voltage mode (CV)" or constant current mode (CC)" to drive the LEDs.

Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode (with LED driver, at area (A) and CC mode (direct drive, at area (B)).

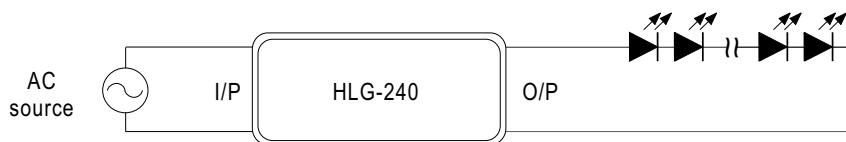


Typical LED power supply I-V curve

### Direct driving :

Under direct driving, the power supply will work in "constant current mode (CC)" and output voltage of the power supply will be clamped by sum of forward voltage ( $V_F$ ) of the LED strip.

The total forward voltage of series connecting LEDs is suggested for 75%~95% of power supply rated output voltage due to concern of the best PF value and efficiency.



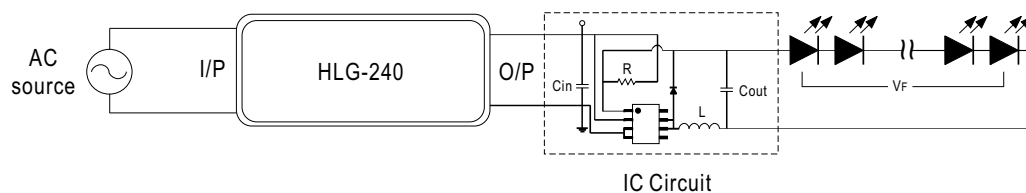
### With LED driver :

Using additional driver, the power supply will work in "constant voltage mode (CV)" and output voltage of the power supply will be kept in rated value.

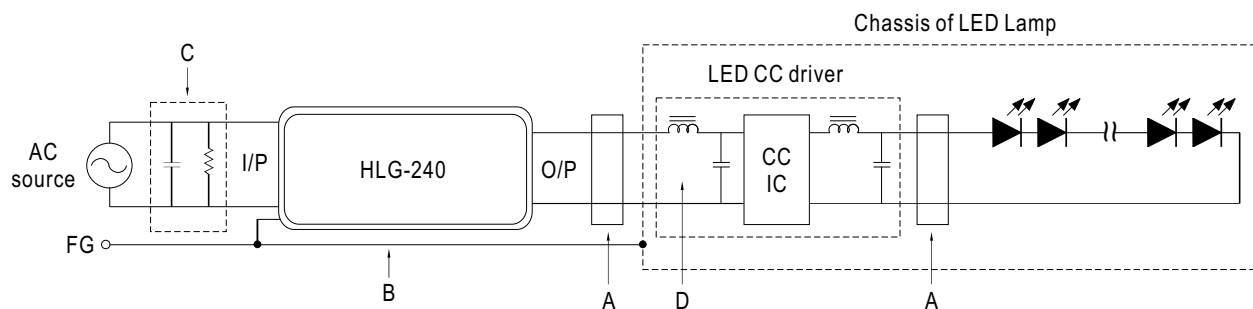
In this drive mode, several design issues need to be considered:

1. Output voltage of PSU must be higher than total forward voltage of series connecting LEDs by 3V minimum.
2. Input capacitor ( $C_{in}$ ) of LED driver circuit should use 2.2uF ~ 22uF (typ.) of rating depends on the operating frequency of the LED driver.

The higher the operating frequency is used, the smaller value of  $C_{in}$  should be chosen, and vice versa.



## EMI DEBUG SUGGESTION

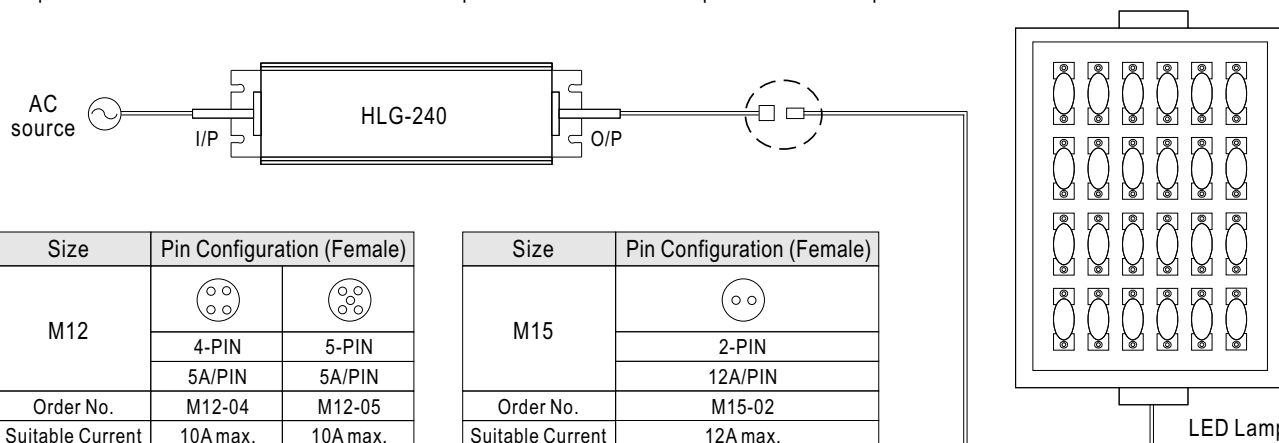


- A. Add a common mode ferrite choke on output wires to reduce the common emission between 10M ~ 300MHz per lighting EMI regulation.
- B. Chassis of LED lamp and chassis of HLG-240 or the FG wire should be connected to the safety ground to reduce the EMI noise, including the conduction and radiation emission.
- C. The additional X-Cap and discharge resistor can reduce the low frequency conduction noise between 9K ~ 1MHz per lighting EMI regulation.
- D. L-C filter should be added at the DC input of LED constant current driver to avoid the differential emission and high frequency noise generated by the CC driver.

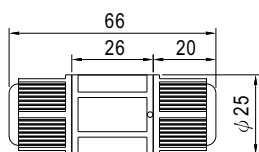
## WATERPROOF CONNECTION

### Waterproof connector

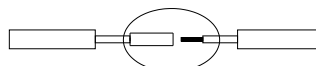
Waterproof connector can be assembled on the output cable of HLG-240 to operate in wet/damp or outdoor environment.



### Cable Joiner



Suitable for 14AWG~22AWG



Up to four wires can be connected through this cable joiner by soldering or clamping by tools.

